Illinois River Watershed
Total Phosphorus Criterion Revision

Chapter 45 & 46 Proposed Rules

Board Meeting
February 16, 2021
Outline

- Introduction
- Chapter 45 Proposed Rules
  - Total phosphorus criterion
- Chapter 46 Proposed Rules
  - Critical condition
  - Calculating 6-month average
  - Beneficial use assessment
Illinois River Watershed

Scenic Rivers

- Illinois River
- Barren Fork Creek
- Flint Creek
Beneficial Uses
Aesthetic Beneficial Use

Illinois River at Watts
History: Total Phosphorus Criterion

2002
Scenic River TP Criterion Adopted
• 0.037 mg/L, 30-day geo-mean

2003
1st Statement of Joint Principles
• OK & AR agreed to coordinated, but individual state actions to reduce phosphorus

2012
Re-evaluation TP Criterion
• Technical re-evaluation of phosphorus criterion
• Technical Advisory Group (TAG), OK confirmed the Scenic River TP criterion
• AR TAG members drafted minority report

2013
2nd Statement of Joint Principals
• Reconcile differences regarding TAG findings
• Formed Joint Study Committee
• Special Study on phosphorus & algae growth conducted

2018
MOA
• OK & AR working together on various actions to improve water quality
2013 Second Statement of Joint Principals

Formed 6-person Joint Study Committee

Responsible for overseeing study on phosphorus & algae

June 2014 - April 2016, Ryan King with Baylor University conducted study

December 2016, Committee Final Report & Recommendations accepted by both state Governors

2020-2021 OWRB rulemaking is an outgrowth of committee recommendations
## Joint Committee Recommendation

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<th>Committee Recommendation</th>
<th>Related WQ Program</th>
<th>Rule Chapter</th>
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<td><strong>A six-month average total phosphorus level not to exceed 0.035 mg/L</strong></td>
<td>Water Quality Criteria</td>
<td>Chapter 45 (Water Quality Standards)</td>
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<td><strong>based on water samples taken during the CRITICAL CONDITION</strong></td>
<td>Water Quality Monitoring</td>
<td>Chapter 46 (Implementation of Water Quality Standards)</td>
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Chapter 45: Water Quality Criteria

Current Criterion
- **Magnitude**
  - 0.037 mg/L
- **Duration**
  - 30 day geometric mean
- **Frequency**
  - Never to exceed

Revised Criterion
- **Magnitude**
  - 0.037 mg/L
- **Duration**
  - Rolling 6-month average
- **Frequency**
  - No more than 1 exceedance per 1-year period
  - No more than 3 exceedances per 5-year period
The total phosphorus six month rolling average of 0.037 mg/L shall not be exceeded more than once in a one-year period and not more than three times in a five-year period.
Chapter 46: Critical Condition

- Joint Committee definition
  "the conditions where surface runoff is not the dominant influence of total flow and stream ecosystem processes."

- Staff analyses served to create operational definition for implementation
  1. Hydrology total flow analysis
  2. Hydrology scour analysis
Chapter 46: Critical Condition

1. Total Flow

When is surface runoff dominant and when is it **not** dominant?

Hydrograph separation analysis to evaluate flow conditions

- Effectively & efficiently identify surface runoff versus baseflow conditions
- Utilized USGS gages throughout watershed
- Consistent approach applicable watershed wide
Chapter 46: Critical Condition

2. Stream Ecosystem Processes

When does flow dominate ecosystem process of interest (benthic algal growth)?

Hydrology scour analysis

- Results very dynamic and highly variable
- Not consistent across watershed
- Analysis very labor intensive
- Not effective for operational definition
The critical condition is when baseflow is fifty-five (55%) or greater of the total daily average flow calculated by the USGS hydrograph separation method sliding-interval.
Chapter 46: 6-month Average Calculation

- How many measured TP values required for each rolling 6-month average?
- Reviewed monitoring programs, found that at least 80% of time at least 1 measured TP value available per month

2 Considerations
1. Monitoring programs need some flexibility, no program is perfect
2. Maximize the number of monthly 6-month averages calculated each year
The calculation of a rolling 6-month average must include at least four (4) measured values from four separate months.
Chapter 46: Proposed Beneficial Use Assessment

- Direct implementation of criterion frequency
  - 1-year
    - No More than 1 exceedance per 1-year period
  - 5-year
    - No More than 3 exceedances per 5-year period

- Minimum number of samples required
  - 10 for 1-year period & 30 for 5-year period
  - Consistent with other USAP sample requirements
Stakeholder Outreach

- **Project specific website**
- **Public Webinars**
  - 3 evening webinars in Sept & Oct
  - 40 – 45 participants each
- **Targeted Stakeholder Meetings**
  - OK Ag Stakeholders
  - OK Environmental Stakeholders
  - NW Arkansas Stakeholders
Stakeholder Outreach

- **Common Topics of Concern**
  1. Concerns regarding critical condition term & P-loading during storm events
  2. Desire for critical condition baseflow threshold to be greater
  3. Significant concern regarding ongoing pollution in the watershed
  4. Desire more implementation actions & enforcement
  5. Downstream protection of Lake Tenkiller
Questions

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Illinois River at Tahlequah